Experimentally manipulated self-affirmation promotes reduced alcohol consumption in response to narrative information

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The trial is registered at ClinicalTrials.gov, number NCT02681900, (https://clinicaltrials.gov/show/NCT02681900).

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Abstract

Background Health risk information is increasingly being conveyed through accounts of personal experiences or *narrative* information. However, whether self-affirmation can enhance the ability of such messages to promote behavior change has yet to be established. ***Purpose*** To test whether self-affirmation (a) promotes behavior change following exposure to narrative information about the risks of excessive alcohol consumption and (b) boosts message acceptance by increasing narrative engagement. ***Methods*** In an experimental design, female drinkers (N = 142) reported their baseline alcohol consumption and were randomly allocated to condition (Self-Affirmation, Control). All participants next watched an extract of a genuine narrative piece in which the central character discussed her liver disease and its link with her previous alcohol consumption. Then, participants completed measures assessing engagement with the narrative and message acceptance. The primary outcome was alcohol consumption, assessed at 7-day follow-up. ***Results*** Self-affirmed participants reported consuming significantly less alcohol at follow-up compared to baseline (mean 7-day decrease = 5.43 units); there was no change in alcohol consumption for the control group. Immediately post-manipulation, self-affirmed participants (vs. control) showed more message acceptance and reported greater engagement with the information. The impact of self-affirmation on message acceptance was mediated by narrative engagement. ***Conclusions*** Self-affirmation can promote behavior change following exposure to health information, even when presented in narrative form.

Clinical trial registration Registered with ClinicalTrials.gov, Identifier NCT02681900.

Key words: self-affirmation, narrative information, defensive processing, alcohol, health-risk information

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It has been estimated that improving six health behaviors could prevent more than 37 million premature deaths worldwide over the next 15 years [1]. However, encouraging people to adopt healthier lifestyles is beset with many challenges, not least defensive message resistance in the target audience. Such resistance can be a significant early barrier to commencing the change process [e.g., 2] so finding and developing techniques to reduce resistance is a priority, as few are available [3].

Self-affirmation – e.g., by reflecting on important personal values or attributes – has been found to be effective in reducing resistance to information encouraging change in a variety of health behaviors. A recent meta-analysis [4] found reliable effects of self-affirmation on subsequent health behavior (d_+ = .32), message acceptance (d_+ = .17) and intentions (d_+ = .14). These effect sizes are comparable in magnitude to those obtained for other health-behavior change interventions, such as education or information and skills training [see 5].

To date, however, studies of self-affirmation have employed a limited range of health-risk materials, focusing primarily on information that is text-based, static, impersonal, and that often conveys numerical risk. Such *statistical* health information remains an important vehicle for health communication, but contrasts with the experiential accounts, in which information is presented dynamically and visually, that are now widely available and easily accessible to those searching for health information [6]. Such *narrative* health information presents "concrete, emotionally interesting information, such as a first-person account of someone who came to experience a particular condition" [7, p. 110]. The narrative format is hypothesized to reduce defensiveness towards the information by increasing narrative engagement (i.e., the process of being "transported into a narrative world" [8, p. 701]. Indeed, like self-affirmation, narrative information has been shown to increase perceptions of risk,

elicit stronger affective responses and more positive cognitions, and promote behavior change [e.g., 7, 9].

Importantly, it is not clear whether self-affirmation will enhance responding to narrative information. Self-affirmation acts to offset the psychological threat embodied in a message that implies one's current behavior is sub-optimal morally and adaptively [10]. To the degree that narrative information conveys such a threat and evokes defensiveness, we would expect self-affirmation to increase openness to it. However, if narratives evoke less defensiveness, there will be less defensive resistance for self-affirmation to ameliorate and perhaps little added benefit to accrue from self-affirming. Moreover, narrative information is typically case-based and thus may be perceived as relatively weak and unpersuasive when exposed to critical scrutiny through any systematic mindset induced by self-affirmation [e.g., 11].

The question arises, therefore, whether self-affirmation can be used in conjunction with narrative information to boost its impact. However, the little evidence that is available is mixed and has not explored effects on behavior at follow-up [12, 13]. Given the growing interest in developing self-affirmation as an intervention, it is important to establish whether it can be used effectively with various types of information and, in particular, whether self-affirmation can promote behavior change in conjunction with such information. As our primary goals we therefore tested (a) if self-affirmation could increase acceptance of narrative information and encourage behavior change and (b) whether the impact of self-affirmation on message acceptance was mediated through the process by which narratives are thought to be persuasive, narrative engagement. In addition, we tested whether the impact of self-affirmation on behavior was mediated by increased message acceptance. We undertook these tests in the context of alcohol consumption, as promoting responsible drinking is a health priority [e.g., 14]. Worldwide, alcohol consumption is the leading risk factor for

premature death and disability among people aged between 15 and 49 [15]. Alcohol consumption is linked to over 40 medical conditions, including cancer, stroke, hypertension, liver disease and heart disease [16]. This, together with research showing that alcohol-related liver disease in young adults has increased in recent years [17], makes it an important behavior to target.

Method

The experiment (registered with ClinicalTrials.gov, Identifier NCT02681900) had a between-subjects design. Participants completed a self-affirmation manipulation or control task before watching an extract from a genuine narrative piece in which the central character (Jo) discussed her liver disease and its links with her previous alcohol consumption. Seven days later we assessed the primary outcome, subsequent alcohol consumption. To establish whether the manipulation influenced the processes by which narrative information has been hypothesized to work, we measured narrative engagement and message acceptance. To maximize personal relevance, we tested female respondents, who were the same sex as Jo.

Participants were recruited through the School of Psychology's participant database and compensated with course credits. When registering interest in the study, participants were asked to complete a separate initial questionnaire, which assessed whether or not they were consumers of alcohol ("Do you drink alcohol?", *yes*/*no*). Materials and measures were administered via Survey Gizmo, both in the laboratory (baseline) and subsequently online (follow-up). After 7 days, participants were emailed a weblink to the follow-up questionnaire. The designated committee of the host University gave ethics approval.

Participants

One hundred and forty-two women, who met the inclusion criterion that they drank alcohol and completed the baseline questionnaire, were randomized to the self-affirmation or control conditions. The mean age was 19.37 years (SD = 2.51) and the average number of

units of alcohol they reported consuming at baseline was 18.89 (*SD* = 14.52). All had English as their first language; most (85.82%) were White British. Almost all (96.48%; *N* = 136) completed the follow-up questionnaire (see Figure 1), resulting in an attrition rate of 3.42%. Tests of differential attrition were not conducted, owing to the low number of non-responders at follow-up.

Materials and Procedure

Page one of both questionnaires contained information regarding consent and ethics. (Full details of materials, measures and procedures can be found in Supplementary Material.) After giving informed consent, participants provided their age, nationality, ethnicity, and baseline alcohol consumption: Participants were asked to report the type of alcohol they had consumed (i.e., beer, wine, spirit), the type of container it was in (i.e., small glass, can, pint, single or double measure) and the number of each of these drinks they had consumed on each day in the past week [cf. 18]. The total number of UK units consumed by each participant was calculated using a UK NHS alcohol unit calculator. (1 unit = 0.34 US fl oz of pure alcohol; there are approximately 2 units in a 175 ml glass of 11% ABV wine.) Next, participants were randomly allocated to condition using the randomization function on the host website, Survey Gizmo. Employing a method used widely in the literature [4], participants in the self-affirmation condition (*n* = 63) indicated their most important value, gave three examples why this value was important to them and one example of something they had done to demonstrate its importance; control participants (*n* = 79) indicated their least important value, gave three examples why that value could be important to someone else, and described something that person could do to show its importance. All participants rated how personally important the value was. Immediately following this exercise, participants viewed an extract from a TV documentary featuring Jo, who had liver disease that was attributed to her alcohol consumption [19]. The extract was chosen to be of a length – approximately 3.5

minutes – typically encountered when exploring video content online. Immediately after viewing the extract, all participants stated correctly which disease Jo had. Participants then completed the dependent measures; all the measures used published and validated scales (see Supplementary Material for details). *Message acceptance* was measured using a broad range of indices of positive responding to the message: ratings of personal relevance, message credibility, message derogation, counter-arguing, negative affect arising from the message, perceived risk, attitudes towards reducing alcohol intake, anticipated regret, and intentions to reduce alcohol consumption (α = .74 - .98). *Narrative engagement* was measured using ratings of ease of visualization, narrative emotion, narrative attention, and perspective taking (α = .81- .93). Finally, participants responded to a retrospective manipulation check comprising 5 items from Napper, Harris, and Epton [20] (e.g., "The task about values made me think about…" *things I don't like about myself* [1] *to things I like about myself* [7]) and answered several questions about their history of liver disease. At follow up, participants completed the same measure of alcohol consumption and a funnel debrief to establish whether they had correctly identified the purpose of the study. None had.

Analytic plan

Two-way ANOVA for mixed designs with condition as the between-subjects IV and time (baseline, follow-up) as within-subjects IV was used to test if condition affected the primary outcome, alcohol consumption. To test whether condition affected the secondary outcomes, message acceptance and narrative engagement, we ran separate one-way MANOVAs followed by univariate analyses of the component measures. The PROCESS macro for SPSS was used to test mediation.

Results

There were no significant differences between self-affirmation and control conditions in baseline measures, including age (M_{sa} = 19.27, SD_{sa} = 1.73; $M_{control}$ = 19.44, $SD_{control}$ = 3.00),

baseline alcohol consumption (M_{sa} = 21.72, SD_{sa} =14.72 units; $M_{control}$ = 17.20, $SD_{control}$ = 14.22 units) or percentage identifying themselves as White British (83.87%$_{sa}$; 87.34%$_{control}$) (all *ps* > .15). Participants in the self-affirmation condition reported choosing a more important value (M_{sa} = 6.33, SD_{sa} = 1.12; $M_{control}$ = 2.79, $SD_{control}$ = 1.47) and had higher scores on the retrospective manipulation check than did those in the control condition (M_{sa} = 5.19, SD_{sa} = 0.99; $M_{control}$ = 4.46, $SD_{control}$ = 0.97), *p*s < .001.

There was a significant main effect of time, $F(1, 135) = 11.00$, $p = .001$, $\eta_p^2 = .08$, but not of condition, $F(1, 135) = 1.23$, $p = .269$, $\eta_p^2 = .01$, on alcohol consumption. Critically, however, the time X condition interaction was significant, $F(1, 135) = 3.88$, $p = .051$, $\eta_p^2 = .03$. Decomposing the interaction using separate within-subject ANOVAs indicated a significant decrease in consumption in the self-affirmation, $F(1, 59) = 13.24$, $p = .001$, $\eta_p^2 = .18$ (M = 16.29, SD = 13.61, M decrease = 5.43 units), but not the control, $F(1, 76) = 0.99$, $p = .32$, $\eta_p^2 = .01$ (M = 15.82, SD = 14.81, M decrease = 1.38 units), condition.

There were significant multivariate main effects of condition on message acceptance, $F(7, 134) = 3.10$, $p = .005$, $\eta_p^2 = .14$, and narrative engagement, $F(4, 137) = 2.51$, $p = .045$, $\eta_p^2 = .07$: self-affirmation increased both (see Table 2). Univariate tests on the individual acceptance and engagement measures indicated that those in the self-affirmation (vs control) condition reported significantly higher levels of negative affect, anticipated regret, more positive attitudes, greater ease of visualization, and more emotion in response to the narrative.

Mediation analysis indicated a significant indirect effect of self-affirmation on acceptance via engagement, $b = 0.14$, SE = 0.08; 95% BCa CI [.004, .304]; $\kappa^2 = .098$, 95% BCa Cl [.014, .197]. The total effect of self-affirmation on acceptance was significant ($b = .31$, $p = .022$), but the direct effect was not ($b = .17$, $p = .141$). Thus, the impact of self-affirmation on message acceptance was mediated through engagement (Figure 2). In contrast, mediation analysis revealed no significant indirect effect of self-affirmation on behavior via message

acceptance, b = 0.03, SE = 1.92; 95% BCa CI [-.737, .838], thus showing no evidence of mediation.

Discussion

Narratives are an increasingly popular way of presenting health information, can easily be accessed online, and are frequently encountered in daily life without active search. They represent a significant and readily available form in which personally relevant health-risk information is conveyed. The principal goal of the current study was to establish whether self-affirmation could promote behavior change following exposure to such information. Encouragingly, the answer is yes. Self-affirmed participants reported consuming significantly less alcohol at 7-day follow-up compared to baseline. There was no significant change in alcohol consumption in the control group. In addition, self-affirmed participants showed more acceptance of the message and greater narrative engagement than did control participants; the impact of self-affirmation on acceptance was mediated by engagement.

The reduction in alcohol consumption in the experimental condition is of a magnitude that would make a difference to future health. At 5.43 units, it equates to approximately 44 grams over the 7 days and just over 6 grams of alcohol daily. Consuming an additional 10 grams of alcohol per day is known to carry significantly increased risks for cancers of the oral cavity and pharynx (29%), esophagus (22%), larynx (44%), rectum (10%), liver (24%) and breast (12%) and increases the total cancer risk for women by 6% [21]. The change in breast cancer risk is dose-dependent and increases with each alcoholic drink. The risk of liver cirrhosis is elevated among women who drink one drink daily and increases with volume of alcohol consumed [14]. Other immediate and longer-term health risks of alcohol also increase with consumption.

It is notable that self-affirmation impacted upon message acceptance through the pathways that have been identified in previous research as the means by which narrative

information proves persuasive: by raising engagement with the information. However, consistent with findings from other studies [see 4], message acceptance did not mediate the impact of self-affirmation on behavior. It is also notable that self-affirmation made a difference despite the possibility that systematic processing induced by self-affirmation could have reduced the persuasiveness of such case-based, experiential information. Future studies should explore the boundary conditions, including the impact of narrative quality (e.g., genuine or fabricated narrative) and how self-affirmation affects uptake of narrative information expressed in a variety of ways, from text through video to virtual reality, together with the duration over which the behavior change is sustained.

The findings of this study must of course be interpreted within the constraints of its limitations. These include the use of an exclusively female sample of relatively young drinkers, a relatively brief follow up period, and self-reports of consumption. However, young women are an important group to sample, given the incidence of alcohol related problems in this group (especially in the UK). Furthermore, self-report measures of alcohol consumption have been shown to be at least as accurate as biomarkers [22]. Nonetheless, future research should extend the findings with different samples and measures and a longer follow up period.

In conclusion, the current findings are encouraging for those who wish to develop and use self-affirmation in interventions to promote health behavior change. Research attention needs to be paid to the boundary conditions that limit the effectiveness of both self-affirmation and narrative methods, especially in combination. Nevertheless, it is clear that in principle self-affirmation can be used to positive effect with narrative as well as statistical information.

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Table 1

Effects of Self-Affirmation Condition on Reported Indicators of Message Acceptance and Engagement.

	Condition			
	Self-affirmation (n = 63) M (SD)	Control (n = 79) M (SD)	F	η_p^2
Acceptance				
Personal relevance	4.25 (1.51)	3.87 (1.57)	2.04	.01
Message acceptance	6.05 (0.78)	5.95 (0.68)	0.63	.00
Negative affect	4.34 (1.03)	3.78 (1.11)	9.60**	.06
Risk	2.76 (1.11)	2.46 (1.13)	2.60	.02
Attitudes	4.34 (0.80)	3.97 (.80)	7.44**	.05
Anticipated regret	2.98 (1.48)	2.49 (1.45)	4.03*	.03
Intention	4.05 (1.63)	4.08 (1.74)	0.02	.00
Engagement				
Ease of visualization	2.72 (1.17)	2.36 (1.10)	3.57*	.03
Narrative emotion	5.25 (1.25)	4.70 (1.50)	5.52*	.04
Narrative attention	5.71 (1.06)	5.68 (1.18)	0.02	.00
Perspective taking	5.44 (1.20)	5.40 (1.15)	0.05	.00

Note. F and η_p^2 refer to the univariate main effects of condition.

*$p < .05$, **$p < .01$, *** $p < .001$

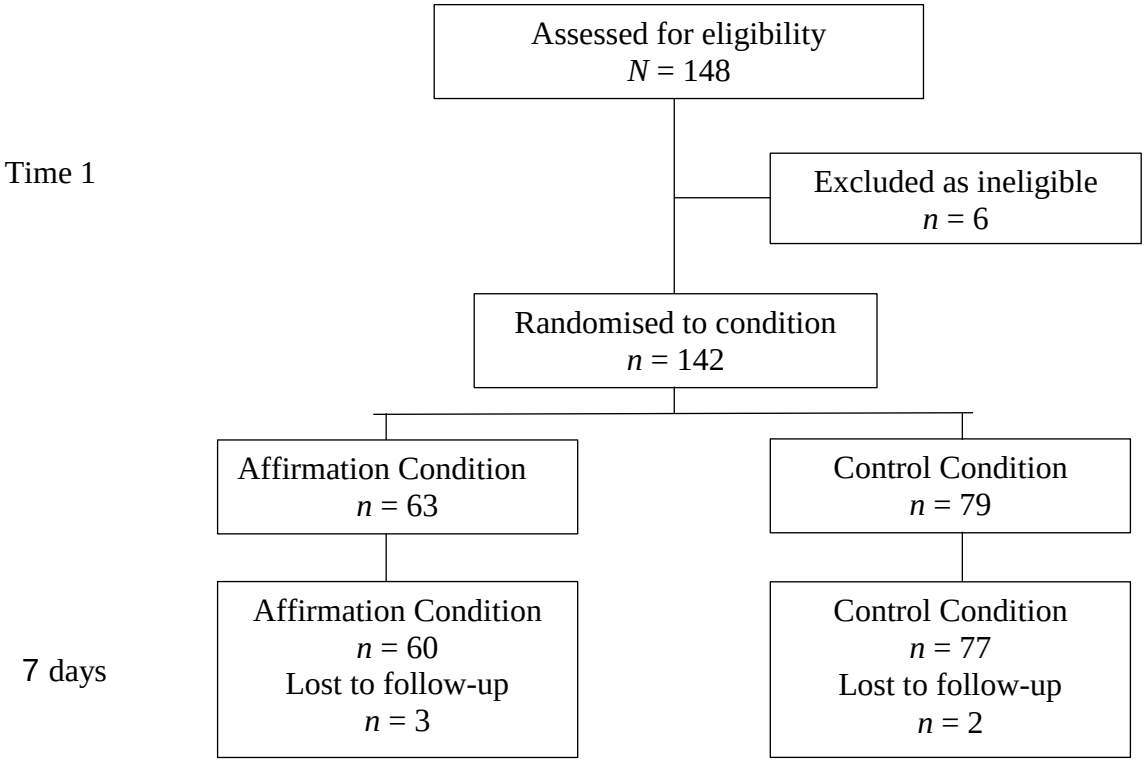
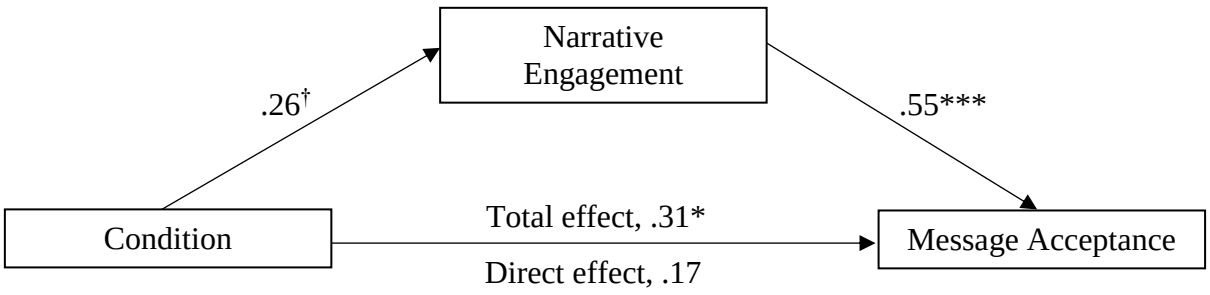


Figure 1. CONSORT diagram illustrating recruitment, enrolment, randomization, and attrition



† $p = .056$, *$p < .05$, *** $p < .001$

Figure 2. Mediation of self-affirmation effects on message acceptance via narrative engagement. The overall means of the acceptance and engagement measures were used for the mediation analyses, reverse scored as appropriate (higher scores indicate more acceptance and engagement).